CUSTOMER NO. 38107

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of U. KATSCHER, et al.	)	Examiner: K. FUJITA
	)	Art Unit: 2624
Serial No.: 10/510,005	)	
	)	Confirmation: 9846
Filed: August 12, 2005	)	
	)	
For: **ORGAN-SPECIFIC BACKPROJECTION**	)	
	)	
Date of Last Office Action: June 3, 2008	)	
	)	
Attorney Docket No.: PHDE020083US/PKRZ201234	)	Cleveland, OH 44114 November 25, 2008

BRIEF ON APPEAL

CERTIFICATE OF ELECTRONIC TRANSMISSION

I certify that this **BRIEF ON APPEAL** and accompanying documents in connection with U.S. Serial No. 10/510,005 is being filed on the date indicated below by electronic transmission with the United States Patent and Trademark Office via the electronic filing system (EFS-Web).

December 1 2008
Date

Patricia A Heim
Patricia A. Heim

I. STATEMENT OF REAL PARTY IN INTEREST (41.37(f))

The real party in interest for this appeal and the present application is Koninklijke Philips Electronics, N.V.

II. STATEMENT OF RELATED CASES (41.37(g))

None

III. JURISDICTIONAL STATEMENT (41.37(h))

The Board has jurisdiction under 35 U.S.C. 134(a).

The Examiner mailed a final rejection on June 3, 2008, setting a three-month shortened statutory period for response.

The time for responding to the final rejection expired on September 3, 2008. Rule 134.

A Notice of Appeal and a request for a one-month extension of time under Rule 136(a) was filed on September 30, 2008.

The time for filing an Appeal Brief is two months after the filing of a notice of appeal. Bd.R. 41.37(c). The time for filing an Appeal Brief expires(ed) on December 1, 2008 (November 30, 2008 being a Sunday).

The Appeal Brief is being filed on the date set forth on the Certificate of Transmission.

IV. TABLE OF CONTENTS (41.37(i))

V. TABLE OF AUTHORITIES (41.37(j))

None

VI. STATUS OF AMENDMENTS (41.37(l))

Amendment D filed August 4, 2008 was not entered.

Second Amendment After Final (Amendment D) of September 30, 2008 was not entered.

An Amendment Accompanying the Appeal Brief (Amendment D) is being filed herewith. Whether this Amendment will be entered or not is not known. However, the accompanying Amendment only cancels one of the rejected claims and addresses typographical errors. Because the Examiner did not object to the proposed correction of in either of the prior Amendments After Final, it is believed that this Amendment will be entered.

VII. GROUNDS OF REJECTION TO BE REVIEWED (41.37(m))

Whether claim 10 and claims 2-5, 11, and 12 dependent therefrom are obvious in the sense of 35 U.SC.§ 103 over Vollmar ("Iterative Reconstruction of Emission Tomography Data...") in view of Townsend (US 6,490,476), further modified by Delaney ("Multi-Resolution Tomographic Reconstruction Using Wavelets").

Whether claim 6 and claims 13 and 14 dependent therefrom are obvious in the sense of 35 U.S.C. § 103 over Vollmar as modified by Delaney.

Whether claim 8 is obvious in the sense of 35 U.S.C. § 103 over Vollmar in view of Delaney.

Whether claim 9 is anticipated in the sense of 35 U.S.C. § 102 by Vollmar.

VIII. STATEMENT OF FACTS (41.37(n))

1. Vollmar purports to be an improvement on the high-overrelaxation single-projection (HOSP) reconstruction algorithm (Vollmar, page 1560, column 1, section B, lines 1 and 2).

2. Rather than providing any disclosure of HOSP, Vollmar refers the reader to his reference [1] Schmedlin (Vollmar, page 1560, column 1, section B, line 1).

3. Both Vollmar and Schmedlin refer to Shepp and Vardi (Vollmar, column 2, line 2; Schmedlin, page 569, section 1, lines 2 and 3).

4. In the ML-EM algorithm, data from a partially reconstructed image is projected into data space, compared with new data to determine a correction (including a convolution operation), and the correction is projected back into the partially reconstructed image, improving the partially reconstructed image (Schmedlin, pages 570-571, section 2.1).

5. To reconstruct a PET image using the Shepp and Vardi algorithm requires more than 80 iterations (Schmedlin, page 569, section 1, lines 2 and 3).

6. The HOSP technique uses a high-overrelaxation parameter (HOP) in conjunction with comparing the projected image data and the

new PET data in data space to speed convergence (Schmedlin, page 569, section 1, third paragraph).

7. When the high-overrelaxation parameters are properly chosen, the PET images can be calculated after eight iterations steps (Schmedlin, page 573, section 3, lines 7 and 8).

8. Vollmar generates an MR image and segments the data using thresholds (Vollmar, page 1560, column 2, section C, first paragraph).

9. Vollmar selects his high-overrelaxation parameters using a-priori information, particularly the segmented regions of the MR image, to apply a local or regional high overrelaxation parameter during the HOSP type reconstruction of the PET data (Vollmar, page 1561, column 2, section III).

10. Vollmar, by using his a-priori modification of the HOSP high-overrelaxation parameters, speeds up the reconstruction and convergence of the final image by a factor of 20 times or more (Vollmar, page 1561, column 2, section III, second paragraph).

11. Vollmar does not disclose forward projecting the segmented second (MR) image to form a segmented second image data set (June 3, 2008 Office Action, page 9, lines 10 and 11).

12. The Examiner asserts that Townsend cures the Fact 11 shortcoming of Vollmar (June 3, 2008 Office Action, page 9, line 12 – page 10, line 2).

13. In Figure 3 of Vollmar, the attenuation correction is performed in the square block labeled "normalization, attenuation-, scatter-, arc-space correction" (Vollmar, Figure 3).

14. Townsend generates a CT image which is divided into regions of pixels which are classified as non-bone or bone by simply thresholding with a threshold of 300 Hounsfield units (Townsend, column 17, lines 23-27).

15. Townsend multiplies the gray scale or pixel values associated with non-bone classified pixels (air, fat, water, blood, soft tissue, muscle, and lungs) by a factor of 0.53 (Townsend, column 17, lines 11-14 and lines 28-29).

16. Townsend scales the bone classified pixels by a factor of 0.44 (Townsend, column 17, lines 29-31).

17. This can be visualized as laying the line of response (LOR) across the attenuation correction matrix to determine the attenuation correction matrix pixels which it crosses and then summing or "forward projecting" the attenuation correction values along that

line to obtain the attenuation correction for the LOR (Townsend, column 17, lines 31-33).

18. The combination of Vollmar and Townsend does not disclose the step of associating the segmented second (MR) image data with the first (PET) image data set to form a segmented first image data set (June 3, 2008 Office Action, page 10, lines 3-5).

19. The Examiner asserts that the Fact 18 limitation is met by Delaney (September 3, 2008 Office Action, page 10, lines 6-14).

20. Delaney is related to a technique for reducing the radiation exposure of a patient during a CT scan (Delaney, page 799, first column, second paragraph).

21. To achieve the Fact 20, Delaney uses a narrow x-ray beam (Delaney page 799, first column, third paragraph).

22. Delaney uses the data from this narrow beam in the described reconstruction technique to reconstruct a CT image which has a higher resolution in one location, e.g., a central region, relative to the rest of the image (Delaney, page 799, column 1, paragraph 2).

23. When Vollmar reconstructs the first (PET) image, it is not a segmented image (Vollmar, page 1561, section II).

24. Vollmar does not disclose the limitation of a portion of the first image data set to be reconstructed in such a manner than the first

tomographic image is calculated exclusively from the portion of the first image data set which is situated in the selected image region (September 3, 2008 Office Action, page 6, lines 10-12).

25. The Examiner asserts that Delaney cures the Fact 24 shortcoming of Vollmar (September 3, 2008 Office Action, page 6, lines 13-20).

26. The limitation of segmenting the first image data set in accordance with the selected image region segmented from the second image to define a segmented first image data set is not shown by Vollmar (June 3, 2008 Office Action, page 7, lines 14-16).

27. The Examiner asserts that the Fact 26 shortcoming of Vollmar is cured by Delaney (June 3, 2008 Office Action, page 7, line 17 – page 8, line 2).

28. Delaney is directed to a reconstruction technique in which a small area of interest is reconstructed at full resolution and the rest of the image is reconstructed at lower resolution (page 799, column 1, second paragraph).

29. The Delaney technique reconstructs the data set produced by using a reduced-width x-ray beam (Delaney page 799, column 2, lines 2-4).

30. The Examiner asserts that Vollmar discloses in the reconstructing of the first image data set, selecting a region to be imaged from at

least one region represented in the second image data set (June 3, 2008 Office Action, page 4, lines 15-17).

31. The Markov values of Vollmar are used to select the high-overrelaxation parameter to be used in the HOSP reconstruction algorithm (Vollmar, page 560, column 2, lines 7-15).

IX. ARGUMENT (41.37(o))

All arguments are new. The arguments have been revised, focused, and expanded to make them clearer to readers who do not work in this technology on a daily basis.

A. Vollmar, Taken Alone, is Not an Enabling Reference

1. Vollmar must be Read with Schmedlin

Vollmar, **taken alone**, is not enabling and proper reference. Specifically, Vollmar purports to be an improvement on the high-overrelaxation single-projection (HOSP) reconstruction algorithm (Vollmar, page 1560, column 1, section B, lines 1 and 2). However, rather than providing any disclosure of HOSP, Vollmar refers the reader to his reference [1] Schmedlin (Vollmar, page 1560, column 1, section B, line 1). It is submitted that Schmedlin, which is of record but not applied, must be combined with and considered with Vollmar in order to provide an enabling disclosure.

Moreover, both Vollmar and Schmedlin refer to Shepp and Vardi (Vollmar, column 2, line 2; Schmedlin, page 569, section 1, lines 2 and 3). Shepp and Vardi has not been made of record, although section 2.1 of Schmedlin does provide a summary of the Shepp and Vardi technique.

2. What does Vollmar, when read with Schmedlin, disclose?

To understand Vollmar, one must first understand the ML-EM algorithm of Shepp and Vardi. In the ML-EM algorithm, data from a partially reconstructed image is forward projected into data space, compared with new data to determine a correction (including a convolution operation), and the correction is back projected back into the partially reconstructed image, improving the partially reconstructed image (Schmedlin, pages 570-571, section 2.1). To reconstruct a PET image using the Shepp and Vardi algorithm requires than 80 iterations (Schmedlin, page 569, section 1, lines 2 and 3).

The HOSP technique uses a high-overrelaxation parameter (HOP) in conjunction with comparing the projected image data and the new PET data in data space to speed convergence (Schmedlin, page 569, section 1, third paragraph). When the high-overrelaxation parameters are properly chosen, the PET images can be calculated after eight iterations steps (Schmedlin, page 573, section 3, lines 7 and 8).

Vollmar suggests that instead of using the same high-overrelaxation parameter across the entire image like Schmedlin, the overrelaxation parameter should be applied based on regions within the reconstructed image. Specifically, Vollmar generates an MR image and

segments the data using thresholds (Vollmar, page 1560, column 2, section C, first paragraph). That is, Vollmar divides areas of the MR image based on the gray-scale level. Soft tissue appears gray. Bone and air both have a very low concentration of resonating hydrogen dipoles and appear black. Typically, manual segmentation is needed when using a MR image to correct a PET image because the black regions corresponding to air provide substantially no PET radiation attenuation; whereas, black regions corresponding to bone provide high levels of PET radiation attenuation. Different tissues and organs have different gray scales, but the MR gray scale level is not directly related to radiation attenuation. However, Vollmar can separate areas of various gray scale levels as well.

Vollmar selects his high-overrelaxation parameters using a-priori information, particularly Markov parameters derived the segmented regions of the MR image, to apply a local or regional high overrelaxation parameter during the HOSP type reconstruction of the PET data (Vollmar, page 1561, column 2, section III). The results of the Vollmar technique are shown and compared with the various prior art techniques in Section II and Figure 5.

The PET image of Vollmar is not segmented. The PET image of Vollmar, like all PET images, illustrates a distribution of radio-isotopes

within the examined region. Rather, Vollmar, by using his a-priori modification of the HOSP high-overrelaxation parameters, speeds up the reconstruction and convergence of the final image by a factor of 20 times or more (Vollmar, page 1561, column 2, section III, second paragraph).

Thus, Vollmar, taken alone, does not provide an enabling disclosure. When Vollmar is read with Schmedlin, as is necessary to understand Vollmar, Vollmar, as set forth in detail below, does not show what the Examiner alleges.

B. The claims are patentable over the references of record.

1. Claims 2-5 and 10-12 Distinguish Patentably over Vollmar, Townsend, and Delaney

Claim 10 calls for forward projecting the segmented second image to form a segmented second image data set. Vollmar does not disclose forward projecting the segmented second (MR) image to form a segmented second image data set (June 3, 2008 Office Action, page 9, lines 10 and 11). The Examiner asserts that Townsend cures this shortcoming of Vollmar (June 3, 2008 Office Action, page 9, line 12 – page 10, line 2). Vollmar does not.

Townsend relates to the attenuation correction of the PET data. In Figure 3 of Vollmar, the attenuation correction is performed in the

square block labeled "normalization, attenuation-, scatter-, arc-space correction" (Vollmar, Figure 3). Townsend explains how one performs attenuation correction of the PET study data using CT images. Specifically, Townsend generates a CT image which is divided into regions of pixels which are classified as non-bone or bone by simply thresholding with a threshold of 300 Hounsfield units (column 17, lines 23-27). Townsend then multiplies the gray scale or pixel values associated with non-bone classified pixels (air, fat, water, blood, soft tissue, muscle, and lungs) by a factor of 0.53 (Townsend, column 17, lines 11-14 and lines 28-29). The bone classified pixels are scaled by a factor of 0.44 (Townsend, column 17, lines 29-31). In this manner, Townsend generates an attenuation correction matrix with an attenuation correction value corresponding to each pixel of the CT and PET images. This attenuation correction matrix is then used to correct each element of PET data or LOR (line of response). This can be visualized as laying the line of response across the attenuation correction matrix to determine the attenuation correction matrix pixels which it crosses and then summing or "forward projecting" the attenuation correction values along that line to obtain the attenuation correction for the LOR (Townsend, column 17, lines 31-33). In this manner, Townsend merely performs the attenuation correction process of Vollmar and is not related to the a-priori

information step or the Cologne HOSP step of Figure 3 of Vollmar. Townsend is irrelevant to the segmentation of PET images. Thus, if Townsend were combined with Vollmar, one would use the Townsend attenuation correction to correct each LOR in the PET data long before the PET data interacts with the MR data of Vollmar. Townsend does not forward project a segmented second (MR) image to form a segmented second (MR) image data set as called for by claim 10.

Claim 10 calls for associating the segmented second image data set with the first image data set to form a segmented first image data set. The combination of Vollmar and Townsend does not disclose this step (June 3, 2008 Office Action, page 10, lines 3-5). The Examiner asserts that this limitation is met by Delaney (September 3, 2008 Office Action, page 10, lines 6-14). Delaney does not.

Delaney is related to a technique for reducing the radiation exposure of a patient during a CT scan (Delaney, page 799, first column, second paragraph). To achieve this, Delaney uses a narrow x-ray beam (page 799, first column, third paragraph). Delaney then uses the data from this narrow beam in the described reconstruction technique to reconstruct a CT image which has a higher resolution in one location, e.g., a central region, relative to the rest of the image (page 799, column 1, paragraph 2).

One could use the Delaney technique to generate the initial CT image of Townsend such that the resultant attenuation correction matrix has a higher resolution in one region than another. But this does not meet the limitation of claim 10 set forth above. Alternately, if Vollmar were to use a CT study instead of an MR study as the second image data, one could use the Delaney reconstruction method as the "any reconstruction method" step appearing right below the "MR study" block of Figure 3 to generate a pre-segmentation image with high resolution in one area than the others. Again, because this step would be performed prior to segmentation of the second image, it does not meet the claim 10 requirement of associating a segmented second image data set with the first image data set to form a segmented first image data set. Moreover, if the Delaney method were used in Vollmar, it would only relate to the reconstruction of the second (MR or CT) image and would not in any way suggest associating data from the MR study with the PET study. The Delaney reconstruction technique would not be performed during the "a-priori information step or the Cologne HOSP step".

Further, claim 10 calls for reconstructing the segmented first image data set into a segmented first image. When Vollmar reconstructs the first (PET) image, it is not a segmented image (Vollmar, page 1561, section II).

Townsend relates to attenuation correction of PET image data and does not relate to or disclose segmentation. Using the Townsend attenuation correction technique in the attenuation correction step of Vollmar would not result in a segmented PET image. Delaney reconstructs a CT image such that it has higher resolution in one region than in the rest of the image. If the "any reconstruction method" step of Vollmar used the Delaney reconstruction technique, a CT second image and the resultant a-priori information would have better resolution in one area than another. However, this improved regional resolution would not alter the Vollmar technique such that the first (PET) image becomes segmented.

Accordingly, it is submitted that claim 10 and claims 2-5, 11 and 12 dependent therefrom distinguish patentably and unobviously over the references of record.

2. Claims 6, 13 and 14 Distinguish Patentably over Vollmar and Delaney

Claim 6 calls for a selection means for selecting, by means of the second image data set, a portion of the first image data set to be reconstructed in such a manner than the first tomographic image is calculated exclusively from the portion of the first image data set which is situated in the selected image region. Vollmar does not disclose this

limitation (September 3, 2008 Office Action, page 6, lines 10-12). The Examiner asserts that Delaney cures this shortcoming of Vollmar (September 3, 2008 Office Action, page 6, lines 13-20).

If one were to combine the fair teachings of Delaney with Vollmar, one would use the Delaney reconstruction technique as the "any reconstruction method" step of Figure 3 of Vollmar. This would result in a second (MR/CT) image with better resolution in one region than the rest. This would enable Vollmar to determine the high-overrelaxation parameter with greater precision in the higher resolution region than the lower resolution region. While this might improve the Vollmar technique by optimizing the selection of high-overrelaxation parameters, it would not alter the Vollmar technique such that it generates a first (PET) tomographic area exclusively from the portion of the first (PET) image data set which is situated in a selected image region.

Thus, Vollmar taken alone or in combination with Delaney, when properly applied, does not result in a PET tomographic image that is calculated exclusively from a portion of the PET image data set, much less a portion that was selected in the MR image.

Accordingly, it is submitted that claims 8, 13, and 14 distinguish patentably and unobviously over the references of record.

3. Claim 8 distinguishes Patentably over Vollmar as Modified by Delaney

Claim 8 calls for segmenting the first image data set in accordance with the selected image region segmented from the second image to define a segmented first image data set. This limitation is not shown by Vollmar (June 3, 2008 Office Action, page 7, lines 14-16). The Examiner asserts that this shortcoming of Vollmar is cured by Delaney (June 3, 2008 Office Action, page 7, line 17 – page 8, line 2). The Examiner is not correct.

Delaney is directed to a reconstruction technique in which a small area of interest is reconstructed at full resolution and the rest of the image is reconstructed at lower resolution (page 799, column 1, second paragraph). If one were to combine Delaney with Vollmar, one would replace the MR study of Figure 3 with a CT study and perform the "any reconstruction method" using the Delaney technique. The Delaney technique could not replace the cologne HOSP iterative reconstruction technique of Vollmar. First, this would undo or remove the entirety of the Vollmar iterative HOSP reconstruction process and replace it with a CT reconstruction process. More importantly, the Delaney technique is for the reconstruction of the CT data set produced by using a reduced-width x-ray beam (page 799, column 2, lines 2-4). In PET scanning,

there is no analog of an x-ray beam. Rather, the PET radioisotope is carried intravenously through the body and its location during imaging is determined by metabolic processes. If the second (MR now CT) image of Vollmar would now have higher resolution in one area than another. This image with areas of different resolution would then be used in the segmentation step and in the assigning of the high-overrelaxation parameters in the a-priori information step. While this might result in more accurate selection of the high-overrelaxation parameters and possibly a higher quality first (PET) image, it would not result in the first (PET) image data set becoming segmented or in the segmenting of the first (PET) image data set.

Accordingly, it is submitted that Delaney does not cure this shortcoming of Vollmar and that even when Delaney and Vollmar are combined, the combination does not meet the limitations of claim 8.

4. Claim 9 is Not Anticipated by Vollmar

The Examiner asserts that Vollmar discloses during the reconstructing of the first (PET) image data set, selecting a region to be imaged from at least one region represented in the second (MR) image data set (June 3, 2008 Office Action, page 4, lines 15-17). The caption to Figure 2 supports the method shown in Figure 3 in which the segmented

regions of the second (MR) image are used to select the Markov fields or values. However, contrary to the Examiner's assertion, these Markov values are used to select the high-overrelaxation parameter to be used in the HOSP reconstruction algorithm (Vollmar, page 560, column 2, lines 7-15). The high-overrelaxation parameters affect the convergence of the iterative HOSP reconstruction process, but do not select a region of the first (PET) image data set to be imaged.

The Examiner asserts that Vollmar discloses in the first image reconstructing step calculating the image reconstruction from image data in region represented in the first image data set that corresponds to the selected region represented in the second image data set. (June 3, 2008 Office Action, page 4, last three lines). The Examiner is not correct.

Vollmar segments the second (MR) image but does not select one of these regions. Rather, Vollmar assigns a Markov parameter to each region which is used to determine the high-overrelaxation parameters to be used in the HOSP reconstruction technique. Due to the different Markov values being assigned to different regions, the high-overrelaxation parameters vary regionally. Although high-overrelaxation parameters vary regionally, the HOSP reconstruction calculates the complete first (PET) image data set into a complete and unsegmented first (PET) image. The reconstructed PET image does not correspond to

a selected region of the segmented MR image. The HOSP reconstructed PET image is a complete and unsegmented image.

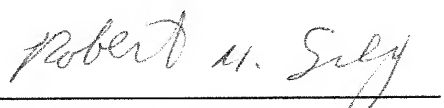
Accordingly, it is submitted that claim 9 is not anticipated by Vollmar.

Vollmar disclosed an improvement in the HOSP iterative reconstruction technique. The HOSP technique is described in Schmedlin whichwas considered by the Examiner (as evidenced by her citing on the PTO-892 attached to the Office Action of September 21, 2007). HOSP generates a PET image which is not segmented. The Vollmar improvement accelerates convergence of the HOSP technique, but does not cause the resultant PET image to be segmented. Attenuation correcting the PET data (Townsend) would not cause the PET image generated by the HOSP technique to be segmented. Using a second (MR) image with different resolution in one region than another (Delaney) would not cause the PET image generated by the improved HOSP technique to be segmented.

CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that claims 2-6 and 8-14 are not anticipated by and distinguish patentably over the references of record. For all of the above reasons, a reversal of the rejections of all claims is requested.

Respectfully submitted,



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APPENDIX

X. CLAIMS SECTION (41.37(p))

1. (Cancelled)

2. (Rejected) The method as claimed in claim 10, wherein the nuclear medical technique includes SPECT or PET.

3. (Rejected) The method as claimed in claim 10, wherein the segmenting step is performed by an automatic segmentation routine.

4. (Rejected) The method as claimed in claim 10, wherein reconstructing the segmented first image data set is carried out by way of iterative backprojection.

5. (Rejected) The method as claimed in claim 4, wherein the iterative backprojection includes:

(a) numerically forming an iteration image data set from the calculated image,

(b) determining a difference between the first image data set and the iteration image data set,

(c) adding the difference to the segmented first image; and

(d) iteratively repeating steps (a), (b), and (c) until at least one convergence criterion is satisfied.

6. (Rejected) A device for selective imaging of body structures, which device includes

first tomographic image data acquisition means for the acquisition of a first image data set,

second tomographic image data acquisition means for the acquisition of a second image data set, which second tomographic image data acquisition means have a resolution which is higher than that of the first tomographic image data acquisition means,

backprojection means for image reconstruction of an image from the first image data set, and

selection means for selecting, by means of the second image data set, a portion of the first image data set to be reconstructed into a first tomographic image, wherein the portion of the first image data set is situated in a selected image region such that the backprojection means co-

operate with the selection means in such a manner that the first tomographic image is calculated exclusively from the portion of the first image data set which are situated in the selected image region.

7. (Cancelled)

8. (Rejected) A method for selectively imaging body structures, comprising the steps of:

using a first tomography method to acquire a first image data set from a first spatial region;

using a second tomography method to acquire a second image data set, the second tomography method having a higher resolution than the first tomography method and the second image data set containing image data that at least partly coincides in space with image data of the first image data set; and

reconstructing the second image data set into a second image;

segmenting the second image to define a selected image region;

segmenting the first image data set in accordance with the selected image region segmented from the second image to define a segmented first image data set;

reconstructing an image from the first image data set.

9. (Rejected) The method for selectively imaging body structures, comprising the steps of:

using a first tomography method to acquire a first image data set;

using a second tomography method to acquire a second image data set, the second tomography method having a higher resolution than the first tomography method and the second image data set containing image data that at least partly coincides in space with image data of the first image data set; and

reconstructing an image from the first image data set;

wherein data from the first image data set used in the reconstructing step is selected using the second image data set;

wherein the reconstructing step further comprises the steps of:

selecting a region to be imaged from at least one region represented in the second image data set; and

calculating the image reconstruction from image data in a region represented in the first image data set that corresponds to the selected region represented in the second image data set.

10. (Rejected) A method of selecting imaging body structures comprising:

acquiring a first image data set from a first spatial region with a tomographic nuclear medical imaging technique;

acquiring a second image data set from a second spatial region with a second tomographic imaging technique, the first and second spatial regions coinciding at least partially in space;

reconstructing the second image data set into a second image;

segmenting the second image to define a segmented second image;

forward projecting the segmented second image to form a segmented second image data set;

associating the segmented second image data set with the first image data set to form a segmented first image data set;

reconstructing the segmented first image data set into a segmented first image.

11. (Rejected) The method as claimed in claim 5, wherein the convergence criteria includes the difference dropping below a predetermined convergence value.

12. (Rejected) The method according to claim 10, further including:

reconstructing the first image data set into a first image;

registering the at least one of: (1) the first and second images and (2) the first and second image data sets.

13. (Rejected) The device as claimed in claim 6, wherein the selecting means includes:

an automatic segmenting means which segments a second image reconstructed from the second image data set, the selected portion of the first image data corresponding to the segmented region of the second image.

14. (Rejected) The device as claimed in claim 6, further including:

registration means for registering the first image data set and the second image data set.

APPENDIX (Continued)

XI. CLAIM SUPPORT AND DRAWING ANALYSIS SECTION (41.37(r))

6. A device for selective imaging of body structures, **{p.4; l. 22-23; p.6, l. 32-34; Fig. 2}** which device includes

first tomographic image data acquisition means for the acquisition of a first image data set **{p. 4, l. 23; p. 7, l. 1-9; M2, Fig. 2}**,

second tomographic image data acquisition means for the acquisition of a second image data set, which second tomographic image data acquisition means have a resolution which is higher than that of the first tomographic image data acquisition means **{p. 4, l. 24-25; p. 7, l. 1-9; M1, Fig. 2}**,

backprojection means for image reconstruction of an image from the first image data set **{p. 4, l. 25-27; p. 7, l. 25-26; M8, Fig. 2}**, and

selection means for selecting, by means of the second image data set, a portion of the first image data set to be reconstructed into a first tomographic image, wherein the portion of the first image data set is situated in a selected image region such that the backprojection means co-operate with the selection means in such a manner that the first tomographic image is calculated exclusively from the portion of the first

image data set which are situated in the selected image region **{p. 4, l. 27-34; p. 7. l. 7-26; M2-M7, Fig. 2}**.

8. A method for selectively imaging body structures, **{p. 2, l. 29-30}** comprising the steps of:

using a first tomography method to acquire a first image data set from a first spatial region **{p. 5, l. 18-21; S2, R2, Fig. 1}**;

using a second tomography method to acquire a second image data set, the second tomography method having a higher resolution than the first tomography method and the second image data set containing image data that at least partly coincides in space with image data of the first image data set **{p. 3, l. 8-20; p. 5, l. 14-17; S1, R1; Fig. 1}**; and

reconstructing the second image data set into a second image **{p. 5, l. 32 – p. 6, l. 16; S4, R3, Fig. 1}**;

segmenting the second image to define a selected image region **{p. 3, l. 23-34; p. 5, l. 33 – p. 6, l. 16; 55, R4; Fig. 1}**;

segmenting the first image data set in accordance with the selected image region segmented from the second image to define a segmented first image data set **{p. 4, l. 1-5; p. 6, l. 13-21; S3, S6, S7, R5, R6, Fig. 1}**;

reconstructing an image from the first image data set **{p. 3, l. 3-7; p. 4, l. 6-12; p. 6, l. 21-31; S8, R7, Fig. 1; p. 7, l. 27 – p. 8, l. 17; Fig. 3}**.

9. The method for selectively imaging body structures, **{p. 2; l. 29-30}** comprising the steps of:

using a first tomography method to acquire a first image data set **{p. 5, l. 18-21; S2, R2, Fig. 1}**;

using a second tomography method to acquire a second image data set, the second tomography method having a higher resolution than the first tomography method and the second image data set containing image data that at least partly coincides in space with image data of the first image data set **{p. 3, l. 8-20; p. 5, l. 14-17; S1, R1; Fig. 1}**; and

reconstructing an image from the first image data set **{p. 5, l. 32 – p. 6, l. 16; S4, R3, Fig. 1}**;

wherein data from the first image data set used in the reconstructing step is selected using the second image data set **{p. 6, l. 17-21; S7; Fig. 1}**;

wherein the reconstructing step further comprises the steps of:

selecting a region to be imaged from at least one region represented in the second image data set **{p. 6, l. 17-21; l. 13-21; A4, R5, R6, S6, S7, Fig. 1}**; and

calculating the image reconstruction from image data in a region represented in the first image data set that corresponds to the selected region represented in the second image data set **{p. 6, l. 23-31; S8, R6, R7, Fig. 1; p. 7, l. 27 p. 8, l. 17; Fig. 3}**.

10. A method of selecting imaging body structures **{p. 2, l. 29, 30}** comprising:

acquiring a first image data set from a first spatial region with a tomographic nuclear medical imaging technique **{p. 5, l. 18-21; S2, R2, Fig. 1}**;

acquiring a second image data set from a second spatial region with a second tomographic imaging technique, the first and second spatial regions coinciding at least partially in space**{p. 3, l. 8-20; p. 5, l. 14-17; S1, R1; Fig. 1}**;

reconstructing the second image data set into a second image **{p. 5, l. 32 – p. 6, l. 16; S4, R3, Fig. 1}**;

segmenting the second image to define a segmented second image **{p. 3, l. 23-34; p. 5, l. 33 – p. 6, l. 16; 55, R4; Fig. 1}**;

forward projecting the segmented second image to form a segmented second image data set **{p. 6, l. 13-16; S6, R4, R5; Fig. 1}**;

associating the segmented second image data set with the first image data set to form a segmented first image data set **{p. 6, l. 17-21; S7, R5, R6; Fig. 1}**;

reconstructing the segmented first image data set into a segmented first image **{p. 3, l. 3-7; p. 4, l. 6-12; p. 6, l. 21-31; S8, R7, Fig. 1; p. 7, l. 27 – p. 8, l. 17; Fig. 3}**.

APPENDIX (Continued)

XII. MEANS OR STEP PLUS FUNCTION ANALYSIS SECTION (41.37(s))

6. A device for selective imaging of body structures, **{p.4; l. 22-23; p.6, l. 32-34; Fig. 2}** which device includes

first tomographic image data acquisition means for the acquisition of a first image data set **{p. 4, l. 23; p. 7, l. 1-9; M2, Fig. 2}**,

second tomographic image data acquisition means for the acquisition of a second image data set, which second tomographic image data acquisition means have a resolution which is higher than that of the first tomographic image data acquisition means **{p. 4, l. 24-25; p. 7, l. 1-9; M1, Fig. 2}**,

backprojection means for image reconstruction of an image from the first image data set **{p. 4, l. 25-27; p. 7, l. 25-26; M8, Fig. 2}**, and

selection means for selecting, by means of the second image data set, a portion of the first image data set to be reconstructed into a first tomographic image, wherein the portion of the first image data set is situated in a selected image region such that the backprojection means co-operate with the selection means in such a manner that the first tomographic image is calculated exclusively from the portion of the first

image data set which are situated in the selected image region **{p. 4, l. 27-34; p. 7. l. 7-26; M2-M7, Fig. 2}**.

APPENDIX (Continued)

XIII. RELATED CASES SECTION (41.37(u))

None